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## the pharmacology of addiction

gerald moore

The centrefold photo in a December 2014 issue of *The New Scientist* shows the head of an adolescent hooked up to the exhaustive array of wires and rubber tubes of an electroencephalographic monitor. As a technique for measuring neuronal activity, EEG is more habitually reserved for coma patients and epileptics, but, along with the offspring of many other anxious Chinese parents, the young man in question is being treated for something quite different. A resident at the Internet Addiction Treatment Centre based in Beijing's Military General Hospital, his diagnosed excess of time spent online is dealt with in much the same way as heroin dependency: through a combination of abstinence, electroshock therapy and, rumour has it, physical torture. His hi-tech headgear is offset by camouflage clothing, which hints at the centre's "military-style activities, including exercise drills and the singing of patriotic songs."<sup>1</sup> Placing well-publicized cultural differences to one side, what might look like therapeutic overkill is perhaps understandable in a region whose South Korean neighbours have seen the virtual rearing of an infant-avatar lead to the death of a real-life baby from neglect, in 2010; and where an epidemic of internet abuse is deemed symptomatic, if not also causal, of the phenomenon of acute social withdrawal that the Japanese term *hikikomori*. But similar stories are also emerging from the US and Europe—of the Oklahoma couple, for example, whose daughter starved while they played *Second Life*—to say nothing of the mounting evidence of diminished concentration and harmful sleep-deprivation among adults who, placing themselves at considerable risk of

disturbed mental health, obesity and heart-disease, now spend more time per day on media devices than they do asleep.<sup>2</sup> In addition to extreme pathological cases, there is concern that we are witnessing a society-wide shift in our mean levels of attention, brought about by digital subjects' increased craving for the constant stimulus of our technological devices.<sup>3</sup> And there is further concern over the ecological circumstances that are leading us to consume in the first place. It isn't just a question of technologies of cognitive and affective overload, but of the anxiogenic, dislocated environments in which the toxicity of addiction is exploited as a kind of anxiolytic cure. Addiction practitioners have spoken of an "addictogenic society"<sup>4</sup> inseparable from industries seemingly intent on creating "addiction by design."<sup>5</sup> More recently, I have suggested "dopaminizing" as the name for an economic model that both targets the extraction of dopamine and simultaneously creates a social instability that underpins pathological forms of consumption.<sup>6</sup>

The emergence of digital addiction within the context of a broader phenomenon of "generalized addiction" has been of particular interest to the French philosopher of technology, Bernard Stiegler, a vociferous critic of our exploitation by consumer technologies that, by seizing hold of our attention, leave us affectively exhausted.<sup>7</sup> The symptoms of what he diagnoses as a "crisis of attention" include not just spiralling rates of attentional deficiency, but the global pandemic of depression and even the 2008 financial crisis, read as the apotheosis of postmodernity's addiction to short-termist thrill-seeking.<sup>8</sup> Drawing heavily on anecdote and a "libidinal economic" theory of desire still grounded in a somewhat metaphysical, Freudian, language of "drives," Stiegler himself provides sparse hard evidence for these claims, thus doing little to dilute his reputation as a nostalgic conservative and excitable panic merchant.<sup>9</sup> His position nonetheless finds substantial corroboration in a growing body of evidence on the transformative effects of prolonged immersion in restricted-focus environments, most notably in an emerging critique of the dominant "disease model" of addiction treatment, which draws on research into brain plasticity and the relation of addiction to social exclusion to reject the identification of dependence with genetic susceptibility and the specific properties of a highly politicized range of narcotics. We can combine this work on the ecology of addiction with Stiegler's interest in the idea that the biological organism is "reinvented" through the technical objects that make up culture. More specifically, his occasional, allusive, comments on the neurology of experiential learning, offer an argument that the dopamine system, so inextricably bound up with addiction, is also the interface through which the neurocircuitry of the brain is organised by the tools, or artificial organs, that condition the physiologi-

cal body. This, in turn, becomes the basis for establishing a relationship between our technological environments and addiction, understood as an adaptive state of interiority corresponding to, and produced by, social breakdown.

Stiegler's account of the construction of desire through technics, shares with the nascent neuro- and sociological approaches to addiction not just a diagnosis, but also a vision for therapy based on creating alternatives to the "proletarianizing," or "dislocated" environments in which addiction takes hold. His argument that desire is a product of the tools one uses to construct oneself a future anticipates the focus of contemporary neuroscience on the creation of "alternative reinforcers"<sup>10</sup> and perspectives that enable addicts to "realign desire," by expanding the "narrowing tunnel of attention" beyond the "immediate relief" of consumption.<sup>11</sup> Underwriting Stiegler's position is his theory and logic of the *pharmakon*, "the cure that is also the poison."<sup>12</sup> This is not the pharmacology of the pharmaceutical and rehab industries, whose mass-production of consumable, commodified treatments risks counterproductively facilitating the indiscriminate disavowal of our underlying symptoms, while simultaneously locking us into ever more restrictive patterns of use. It refers, rather, to the idea that the issues arising from the prevailing technological culture can be mitigated and overturned through the re-organisation of the tools and techniques of entrapment to create ways out of an impasse.

## ADDICTION AND THE *PHARMAKON*

The addictions supported and induced by all manner of *pharmaka*—kinds of fetish and writing, technics in general *qua* supplements in general—form a logic of the supplement that is transformed over the course of the history of the supplement, in which the forces that shape libidinal economy are also transformed, and in which addictions are the supports of the games of mutual dependence through which humans are linked, starting with love—the highest form of addiction. In other words, addictions are the concretization of the process of adoption in which psychic, collective and technical individuation consist.<sup>13</sup>

Stiegler's conception of the *pharmakon* is Platonic in origin, inherited from *The Phaedrus*, a text ostensibly on the nature of love, but which since Derrida's *Dissemination* (1972) has been read predominantly in terms of its ending on the intoxication of writing. Composed around 370 BCE, at around the time of *The Re-*

*public*, the dialogue begins with Socrates encountering the eponymous Phaedrus on his way to the country. Phaedrus is concealing something in his cloak and the philosopher rightly guesses that it is the written text of a speech on love (228d), which his companion confesses he is off to reread and consume to excess in private, beyond the admonishing gaze of Athens's elders.<sup>14</sup> Although famed for never venturing beyond the Athenian walls (230d), Socrates announces that Phaedrus has "found a potion to charm me into leaving" society behind, and which he'll pursue like a hungry animal until he gets his fix (230d). In a series of claims that are complicated by his penchant for irony, Socrates declares himself "sick with a passion for hearing speeches" (228b) and roused into a "frenzy" at the prospect of the text (234d). The language of pathology becomes more pronounced over the course of the ensuing conversation, in which the visceral experience of love—be it for people or physical objects—is portrayed as a sickness in the head (231d), a cause of rage, social withdrawal, bad judgement and loss of wealth (232c, 234b, 252a). Socrates compares lovers to beggars (233e) and famously evokes cicadas as the legacy of people so entranced by music that they stopped eating and drinking and died (259b-c). As the addiction psychologist Bruce K. Alexander has observed of comparable passages in *The Republic*, "there can be little doubt" that such symptoms "are similar to contemporary depictions of severe addictions."<sup>15</sup>

The image of Socrates as craven nuances his frequent depiction as ascetic and abstemious, exemplified perhaps most notably in *The Symposium*, where he plays the chaste master of desire to the addled and weak-willed Alcibiades (212e-214a). But in *The Phaedrus* he holds back from advocating complete abstinence. Despite his reputation for mistrusting writing, Plato makes a series of crucial distinctions between "slavish" love, experienced at the level of the bodily pleasure, and a higher love of the soul (258e); love for its own sake, fetishized as an end in itself, and love as a means to the end of truth. To each of these poles there corresponds a distinct kind of "madness," the craving induced by addiction and the headiness of intoxication: "one produced by human illness, the other by a divinely inspired release from normally accepted behaviour" (265b). The kind of writing craved by Phaedrus—a text to be devoured for amusement and the thrill of its composition—falls short of the writing that serves only as an instrument, a means of accessing "what is truly written in the soul" (277e-278e). Writing is thus not intrinsically bad or addictive, but a "pharmakon" (275a), toxic or redemptive, depending on whether it enslaves or liberates the body. The term means both "good *and* evil," "remedy *and* poison," but as Stiegler explains, commenting on *The Phaedrus*, "the *pharmakon* becomes a poison only when it provokes dependence."<sup>16</sup>

Stiegler complicates the alignment of toxicity and dependence, by stating that addiction, too, is pharmacological. There are toxic and curative addictions, and our relationship with technics is moreover always one of addiction, in the sense that the life of the mind, or what Stiegler terms “spirit,” is constitutively dependent on the material, technical supports in which we are externalized. If the “noetic soul” is “addicted” to its technical objects, it is because technical objects are the supplements without which it cannot exist, serving as the (“atranscendental”) conditions of users’ horizons of expectation, attention and desire; hence the claim that “the great addiction, making all others possible, is spirit.”<sup>17</sup> Socrates’ idea of “writing in the soul” thus becomes, for Stiegler, a literal statement about the way that the neuronal circuitry of the brain is continuously rewritten and organized by our technical prostheses.<sup>18</sup>

The groundwork for this idea is laid out in the *Technics and Time* series, in which technical objects are formulated as external memory supports, or ‘tertiary retentions’ that generate “protentions,” causing consciousness to anticipate the futures that might be realized when we use tools to build artificial environments.<sup>19</sup> Stiegler’s subsequent work develops this into a theory not just of time, but of the unconscious, elaborating on Freud’s ideas on the plasticity of the libido and Winnicott’s work on “transitional objects” to argue that desire is created when we stand in an affective relation to possible futures that we are able to envisage through the adoption of tools that facilitate their realization. The experience of desire to which different tools give rise varies depending on the kind futures they enable us to project, and the extent to which these futures offer deferred or immediate, enduring or throwaway gratification.<sup>20</sup> The formation of desire is characterized by addiction when adhesive libido attaches itself to *pharmaka* that generate rhythms and expectations of such immediate reward that the focus of attention becomes narrowly fixated on the present. The relation to a more distant future breaks down, locking the addict into a cycle of short-termist acquisition and despair.<sup>21</sup> Strictly speaking, where automated craving dominates over the anticipation tied to the realisation of longer term projects, Stiegler argues that desire cannot even be formed. The latter only comes into existence when biological “drives” are “disautomated,” or “sublimated,” through “the differance of pleasure,” the deferral of quick hits of gratification for the sake of a more distant expectation of reward.<sup>22</sup>

The language of libidinal economy will inevitably make for consternation in the Freud-averse extended world of the harder sciences, but the argument translates

into the discourse of contemporary neurology. The most pertinent parallel is found in the brain's dopamine system, which plays a decisive role in establishing horizons of anticipation and the motivation to realize them. The central component of neural mechanisms of reward, the dopamine system is also fundamental to a biophysical version of Stiegler's distinction between automatic drives and plastic desire, understood to differ, not in kind, but by degree, pertaining to shorter and longer circuits in the iterations of libido. Dopamine doesn't correspond directly to pleasure and the satisfaction of desire ("liking"), but rather to "wanting" and expectation.<sup>23</sup> The evolutionary value of the dopamine system consists in it being the trigger that teaches and reminds us to eat and procreate, by attaching craving for repetition to memories of satiation and pleasure. The release of dopamine into the *nucleus accumbens*, the part of the basal forebrain that controls motivation and goal-directed behaviour, coincides with the creation of new neuronal connections, which are reinforced by the anticipation of reward.<sup>24</sup> Dopamine thus plays a constitutive role in our ability to form habits and learn from experience, influencing the kinds of protention that are attached to acquired behaviours. In a point that gains significance when paired with Stiegler's claim that time is produced through technics, this rhythming of attention is thought to be a major component in creating our sense of temporality.<sup>25</sup>

The addict is not hedonically motivated by a guaranteed access to pleasure, but, rewired by dopamine to crave the chemical's continued release, joylessly consumes in spite of a higher-order volition to go clean. The same pattern holds true for the tormented lover, who manifests all the symptoms of addiction. In its curative pharmacological dimension, love opens up alternative futures by automating new habits and transforming our horizons of expectation; Stiegler reads it in terms of a shared relation to the tools through which we construct a life that lifts us above mere adaptation to circumstance.<sup>26</sup> When it turns toxic, the love-addict endures the same impossible choice between tortuous, destructive consumption or withdrawal sickness and the overwhelming disruption of everyday life. A toxic addiction would be one that entails a dehumanizing life lived in servitude to the objects that hijack the body, restricting us to regressive patterns of consumption as an end-in-itself. Both love and drug addiction trigger the flow of dopamine into the reward pathway of the brain and evidence links the neurotransmitter to all forms of experience associated with dependence, craving and repetitive urges.<sup>27</sup>

In an essay that sketches out a systems-theoretical approach to addiction, "The Cybernetics of 'Self': A Theory of Alcoholism" (1971), Gregory Bateson accounted



for the difficulty of renunciation by arguing that the alcoholic's selfhood is not somehow independent of drink, but forms "only a small part of a much larger trial-and-error system" in which alcohol itself "does the thinking, acting, and deciding."<sup>28</sup> Stiegler reiterates this position, describing how technical objects bring about a function-shift in our physiological organs, transforming our field of experience. Just as the experiential coordinates of the drunk revolve around inebriation, those of one who lives through their smartphone will be mediated by the habituation of their eyes and hand to the touchscreen. In both instances, the *pharmakon* both emboldens and impairs decision-making in accordance with the curative and redemptive logic of pharmacology. This making and unmaking of habits amounts to a "defunctionalization and refunctionalization" of both the body and brain, which become adapted to the new objects of their attention. For the most part, Stiegler's analysis is psychoanalytic in register. When limbs and senses forge new relations with technical instruments, "these organs no longer economize libido in the same manner," which is to say: induce a shift in expectation, desire and attention.<sup>29</sup> But the science of neuroplasticity, more familiar in the work of Catherine Malabou, is also at work in the background. The reinvention of the body through new tools coincides with a "reorganization of the cortex" and the "formation of neuronal circuits," the creation of synaptic relations that these tools "*literally* inscribe . . . *into* the cerebral organ."<sup>30</sup> Although Stiegler does not refer to it himself, the dopamine system is at the heart of this process of inscription. It occupies a privileged position within the circuitry of what he terms "general organology," a concept that encompasses the relations between physiological organs, artificial organs (technical objects, *pharmaka*) and the cultural organisations that govern how our technical prostheses get used.<sup>31</sup> In the sense of being both cure and poison, dopamine is itself a *pharmakon*, or at least, a fundamental physiological correlate and nexus through which technical organs de- and refunctionalize the body.

## PHARMACOLOGY OF THE DOPAMINE SYSTEM

Addiction is broadly understood as an "overwhelming involvement" with a pursuit that becomes detrimental to both society as a whole and to the individuals whose self-administration comes at the expense of other (professional, familial, social) activities.<sup>32</sup> There is widespread recognition of its multiform causes, which comprise varying (and debated) degrees of genetic susceptibility plus environmental factors, such as poverty, trauma, and access to addictive substances.<sup>33</sup> The dominant approach among specialists narrows this down, locating the addict's



problems in “a primary, chronic disease of brain reward, motivation, memory and related circuitry,”<sup>34</sup> characterized by a fault in the dopamine system of neurotransmission, which is to say, in the parts of the brain that establish communication between past experience and future decision-making. The dominance of this “disease model” of addiction is exemplified by the central role it plays, for example, in the treatment ethos of Alcoholics Anonymous, whose prescription of complete abstinence is underpinned by a presumed link between uncontrollable cravings and structural changes in the wiring of the brain, supposedly induced by substances with *virtus dormitiva*-type addictive properties.<sup>35</sup> The changes in brain chemistry are what account for the classical etiological distinctions between “physical,” “substance dependences” and the mere “psychological” cravings still frequently deemed to pertain to everything else.<sup>36</sup> Yet emerging evidence points to “strong neural similarities” that effectively deconstruct the distinction—in the Derridean sense of undoing a supposedly rigid binary—between “physical” and “psychological” addiction, and in so doing undermine the basis of the disease model.<sup>37</sup> It is increasingly recognized that “every experience that has potent emotional content changes the NAC [*nucleus accumbens*] and its uptake of dopamine,”<sup>38</sup> meaning that the dopamine system can be programmed by technology just as much as Class A drugs: “Video games, like Internet porn, meet all the conditions for plastic brain map changes,” with users manifesting typical symptoms of disavowal, craving, neglect of other activities and withdrawal, as well as a diminished capacity for attention.<sup>39</sup> Experimental measurements, for instance, connect computer games to increased craving for high levels of sensory stimulus, which leaves gamers more easily distractible in less immersive environments. Korean and Taiwanese studies suggest that half of children addicted to internet gaming qualify for diagnoses of Attention Deficit Hyperactivity Disorder (ADHD), and where 18% of 15-23 year-old students classed as internet-addicted showed symptoms strongly linked to ADHD. Debates persist over whether correlation entails causality, which is to say, whether those with ADHD are more susceptible to the freely available addictive games, or whether the technology itself is a cause of the addiction. The alternative is not that “one is causing the other, but that both are symptomatic of the same single common brain state: two sides of the same mental coin.”<sup>40</sup>

At its best, one might say, dopamine serves as an expression of the plasticity that, in anthropological terms, makes us distinctively human, by furnishing the mechanism through which the acquired experience of the past generates expectations and anticipation of the future. At its worst, however, “excessive associative learning” means that we habituate ourselves to the expectation of a reward that is not

forthcoming, giving rise to a vicious circle, by desensitizing the reward circuitry of the brain to the point where we need more and more to achieve the same effect.<sup>41</sup> The dopamine system becomes saturated in such a way that only the addict's drug of choice triggers the chemical's release. As the synaptic pathways that fire in response to the object of addiction are reinforced, other pathways in the prefrontal cortex weaken and are "pruned" away, further narrowing the horizons of attention and leaving us unable to form new connections, envisage possibilities of desire, that could counteract the tightening grip of the neurotransmitter.<sup>42</sup> We are locked into a dehumanizing spiral, where constant craving leaves us incapable of experiential learning, unable to imagine alternative futures. The use of the term "dehumanizing" is not incidental, here: neuroplasticity is far greater in *Homo sapiens* than in chimpanzees and other mammals, who can generate only a fraction of our neural connections.<sup>43</sup> Research also shows that rats and primates, with their smaller frontal lobes in the cerebral cortex, lack the specific (D2) dopamine receptors that constitute a highly developed "Stop impulse" in (non-adolescent) humans. This "Stop impulse," which has been described as "the voice of reason," is precisely what is compromised when dopamine-induced cravings short-circuit our ability to project horizons of expectation.<sup>44</sup> Lewis explicitly equates this short-circuiting with a regression to child-like behaviours and "constellations" of neuronal wiring "more typical of kids than adults." In the absence of (pruned) synaptic connections that would enable the switching of attention away from cravings, the addict falls back on "primitive" and "childish," affectively exhausting, attempts to suppress their inclinations, the end result of which is "ego fatigue," or the depletion of the capacity for self-control.<sup>45</sup> The same language of immaturation and dehumanization is used by Stiegler, who writes of our infantilization by a society organized around advertising's prescription of consumption.

The second chapter of Marcel Mauss and Henri Hubert's classic, *Sacrifice: Its Nature and Function* (1899), offers a detailed description of various rituals through which the (hitherto profane) participants, site and instruments of sacrifice are performatively cleansed, elevated to the status of the sacred, by the adoption of specific clothes and instruments that keep sacrifice distinct from murder. Sacrificial blades are either stored in special cells, withdrawn from any contact with the unpurged, or manufactured anew for each occasion and jettisoned—for example, thrown into the sea—as soon as a sanctioned killing has taken place.<sup>46</sup> Similar accounts from Detienne and Assoun, among others, confirm that the function of such ritual is to enact the sacredness of a fetishized object, preventing its collapse back into profanation.<sup>47</sup> The Stieglerian argument is that such sacrificial

rituals have now given way to a reversal in which marketing prescribes what was once proscribed: the fetishized technical object is no longer kept at a safe distance to mitigate misuse, but relentlessly presented for a consumption we cannot refuse.<sup>48</sup> The organisation of society now falls to rituals of commerce explicitly targeted at the reward systems of the brain, with the intention of getting consumers deleteriously hooked on the high-stimulation, immediate gratification they promise. We are continually bombarded with the injunction to consume by advertisers who, fetishizing the curative aspect of *pharmaka* with minimal concession to their toxicity, compete for consumers' "brain availability" (*temps de cerveau disponible*) and reduce self-control to an afterthought of small print.<sup>49</sup> The ways in which we employ our consumer technologies are moreover predominantly determined by similar forms of prescription, notably proprietorial modes of use that limit our artefactually constructed horizons of expectation to preprogrammed pathways set in place by manufacturers. The "vast subservience of individuals to apparatuses" of consumerism "induces regression to minority," the decomposition of the deferred pleasure of desire into the servicing of short-termist, compulsive drives.<sup>50</sup>

In a formulation rendered problematic by its suggestion of a passage, or "sublimation," of animal automation into rational desire and "desublimating" return to animality, but which is perhaps lent a measure of credence by the less developed plasticity and resistance to compulsion of other species that have been studied, Stiegler describes this regression as "*bestialization*."<sup>51</sup> We are "bestialized" when locked into restrictive environments that provide "no alternative" to consumption and idiocy ("*la betise*"). Echoing Andy Clark's claim that "environmental engineering is also self-engineering,"<sup>52</sup> Stiegler identifies a major factor in the genesis of addiction as manufactured cultural environments that privilege what Graeber would call systemic "structural stupidity," referring to conditions that actively curtail the imaginative labour of those who are confined to them.<sup>53</sup> Bestialization is thus synonymous with what Marx called "proletarianization," a concept that Stiegler reworks to denote a situation of structural imbalance. The mutual constitution of the *who* and the *what*, the subject and the technical object, becomes massively skewed towards users using tools to consume but not to produce. The kinds of "proletarianizing" technologies privileged by consumerism and the cultural rules that govern their adoption mean that the tools through which we interface with the world reinvent us, adapting us to them, without us being able to employ them for active self- and environmental transformation. The effect of repeatedly bombarding the senses with the high-intensity, monocultural stimuli of our desk-bound, screen-enthralled existences is to leave the brain profoundly

lacking in what Stiegler and I have termed “noodiversity,”<sup>54</sup> and Warren Neidich “epigenetic, neural biodiversity,”<sup>55</sup> referring to the variety and vitality internalized by and reproduced in the life of the mind. Cognitive, consumer capitalism brings about a widespread “destruction of attention” and “a *generalization* and *mutation* of addiction,” meaning a diminution in the kinds of tools that foster the curative dimension of the *pharmakon*, and a proliferation of those that, by priming us for immediate gratification, short-circuit the deferral of pleasure through which drives are sublimated into desire.<sup>56</sup> Reworked through the discourse of the new addiction sciences, where addiction is less a disease than the side-effect of a plastic brain that reshapes to fit its environments, we might say that the homogenization of cultural stimulus goes hand-in-hand with the neural-Darwinian pruning of pathways no longer activated by our technological milieus. Focused around industrialized dopaminizing, or the constant triggering of dopamine hits, coupled with locked in, passivified consumption without production, the narrowing diversity of our technological diet gives rise to a negative feedback loop in which we lose the very diversity of neuronal relations that could enable us to envisage and create alternative futures.

In saying this, Stiegler’s pharmacological approach intersects not only with neuroscientific work on the plasticity of the dopamine system. It also lends itself to research that downplays the significance of dopamine, in favour of focusing on the relationship between addiction and contextual dependence. This line of argument suggests that toxic forms of addiction should be understood less in terms of chemical changes in the brain than in terms of the environments that occasion their use. According to its logic, we take drugs to escape from surrounding misery and it is the misery rather than the drugs that traps; the latter, for the most part, only exacerbate the entrapment of the former.<sup>57</sup>

## POVERTY OF SPIRIT

At the end of the twentieth century, the capitalist way of life has become an addictive process that is decreasingly capable of bringing satisfaction, leading to a widespread malaise in the consumption that has replaced culture.<sup>58</sup>

Routinely invoked to justify the “War on Drugs,” received wisdom on the dangers of addiction tends to draw on now legendary stories of clinical experiments in which lab rats and monkeys repeatedly self-administer cocaine and heroin to

the point of oblivion. The findings have long been presented as proof of the intrinsically addictive properties of narcotics, with researchers paying little attention to the stressful circumstances in which the animals recourse to intoxication. But subsequent experiments have demonstrated that the rats disautomate their behaviours when housed in more sociable environments. When provided with other rats and play activities to keep them occupied in Bruce K. Alexander's "Rat Park" experiments, the drugs become dramatically less attractive.<sup>59</sup> The so-called "spontaneous remission" of the inhabitants of "Rat Park" mirrors the behaviour of American soldiers returning from Vietnam, whose heavy consumption of readily available, high-grade heroin amid the fog and stress of war never translated into a much feared crisis of addiction upon their return home, when only 10% continued to abuse.<sup>60</sup> It also fits with evidence that between 50-80% of addicts will stop using voluntarily, without the need for professional intervention.<sup>61</sup> The evidence that environmental change leads to behavioural disautomation lends itself to what Alexander calls the "dislocation" theory of addiction. This theory casts addiction as an understandable and moreover "adaptive" response to the demoralising, alienating effects of community breakdown, or the "poverty of spirit" that comes about when "society systematically curtails psychosocial integration in all of its members."<sup>62</sup>

Returning to Ancient Greece, Alexander suggests that the Socratic ethics of "self-control," meaning the reigning in of appetitive desire and 'weakness of the will' (247d, 250b), should be read in the context of a putative prevalence of addiction in Athenian society, which can itself be traced to the violent upheavals of the time, namely the decline of the golden age of democracy and slide into tyranny that came off the back of the Peloponnesian Wars of 431-403BCE.<sup>63</sup> The image he paints is in keeping with others' descriptions of toils of war that left the *demos* susceptible to demagoguery and commercial interests, effectively excluding citizens from political decision-making. They reacted to this exclusion by further withdrawing from the generational family structures that organized the *polis*. Traditionally obligatory and highly regimented communal meals (*syssitia*), intolerant of drunkenness, increasingly gave way to debauched private clubs hosting *symposia*—the drinking parties from which Plato's other famous critique of physical love takes its name.<sup>64</sup> Eric Havelock situates this dramatic shift in social organisation in terms of the transition from oral to written society. Prior to the invention of writing, he argues, Athens had been a rigidly hierarchical culture based on the disciplined rote-memorisation of poetry, in which oral poems served as a vehicle for the transmission and learning of unwritten laws. As writing grew in popular-

ity over the course of the fifth century, the increasing ability and temptation to rely on written texts entailed the perceived loss of discipline and a rise in the use of text for social criticism, which exacerbated the loosening hold of traditional forms of authority over younger Athenians.<sup>65</sup> With the advent of digital technologies, and in circumstances exacerbated by the liquid society of capitalism, we are living through an analogous transformation between social-technical systems, and a corresponding spike in addictive behaviours. This time, it is not writing and alcohol that escape attempts at social moderation, but consumption as such, comprising everything from sugary fast food and gambling to technological gadgets that offer an escape from the entrapment of everyday life.

Comparing Athens to the present, Alexander argues that contemporary Western society is characterized by a similar failure of “psychosocial integration,” in which shopping—and increasingly also religious fanaticism—serves as a “pseudosolution” to the experience of dislocation, filling the void left open by the sacrifice of community and meaningful employment to the creation of wealth.<sup>66</sup> For Stiegler, the same set of circumstances mean that Alexander’s spiritual “poverty” has grown into a full-blown “crisis of spirit,” marked by systemic paralysis of participation and social mobility and symptomatized by disaffection and a dulling of the senses that corresponds in turn to a “loss of the feeling of existence.”<sup>67</sup> We have internalized the neoliberal ideology of TINA: “there is no alternative” but to adapt to the competitive, liquid environments forced on us by late capitalism.<sup>68</sup> It is in this context that consumption to the point of addiction becomes a short-termist strategy of adaptation, dulling the pain of dislocation through “affective saturation” while holding open the dim prospect of redemption, to be eeked out through the castrated fantasies of one who cannot change the future, but who can buy fleeting moments of respite from the mundanity of the present and cling to the prospect of becoming heroic in some virtual world detached from this one. Anecdotal figures of over one million Japanese *hikikomori*, the predominantly male, younger members of society who withdraw from all forms of social interaction and spend their lives in their bedrooms, surfing the net and playing videogames, are offered up by Stiegler as evidence of this. He doesn’t acknowledge that both the figures and the link to addiction are disputed.<sup>69</sup> The other evidence Stiegler cites for the impact of “generalized addiction” is similarly conspicuous in its sparsity, comprising a couple reports on the potentially deleterious relation between prolonged television exposure and the synaptic development of two-year-olds,<sup>70</sup> plus a short essay by a literary critic who has since distanced herself from the scale and political implication of his conclusions.



In that article, the seminal “Hyper and Deep Attention: The Generational Divide in Cognitive Modes” by N. Katherine Hayles, Hayles proposes that we are witnessing a technologically-induced “generational shift” away from the “deep attention” of the age of the book, towards the “hyper attention” and “low tolerance for boredom” of digital natives.<sup>71</sup> Her argument has become a constant reference for Stiegler,<sup>72</sup> despite what Hayles dismisses rather hastily as his “broad condemnations” of contemporary technology and corresponding disregard for the pedagogical strategies she proposes as an antidote to attentional narrowing.<sup>73</sup> He, too, perhaps understates the extent to which Hayles anticipates his own pharmacological response to the effect of dramatic technological change on the impoverishment of spirit. Recognizing that “the dopamine cycle is not the whole story,” Hayles notes that video games succeed when the cravings they elicit are underwritten by gaming environments that facilitate “achievement, freedom, and in some instances connections to other players even more satisfying than the fun of playing. Stimulation works best, in other words, when it is associated with feelings of autonomy, competence, and relatedness.”<sup>74</sup> Her comments converge with findings in the therapeutic field, which stress how the momentary oblivion of the addict negates the opposing experience of dependence, failure and disconnection. In using, the user withdraws from the toxicity of surrounding environments and finds respite from a “*sense of overwhelming helplessness*,” “the unbearable sensation that no options are available,” which addiction functions psychologically to reverse.<sup>75</sup> By way of partial illustration, the anthropologist Natasha Dow Schüll relates how gambling addicts enter into a pacific, trance-like union with the betting terminal, a “machine zone” where “the whole world is spinning around you, and you can’t really hear anything. You aren’t really there—you’re with the machine and that’s all you’re with.”<sup>76</sup> Dopamine hits alleviate anxiety in the face of chaos. Withdrawal into gaming, shopping and social media is as much about avenues of escape that substitute for the frustrations of “bullshit jobs” and societal sclerosis. But when *pharmaka* open onto worlds that hold out the prospect of success elsewhere, the possibilities of harnessing them for environment-making and self-invention can trump the automated craving.

For Stiegler and Hayles alike, the trick would be to reorganize technological culture in such a way that intermittently glimpsed moments of redemption translate back into wider society, becoming a means for *de*-proletarianization, or participation in, rather than exclusion from, the construction of symbolic order. A similar line of thought is at the heart of campaigns to decriminalize drugs, the aim of which is to lessen the vicious cycle of stigmatization and marginalization



that entrenches addicts in their social dislocation, by treating reintegration as a prelude to self-reinvention.<sup>77</sup> The technological equivalent of decriminalization would be to replace an industrial model organized around the legal enshrinement of a hyperspecialized division of labour and the proprietary control over increasingly narrow uses of technology with an “economy of contribution” that allows consumers to reinvent themselves as amateur participants in the design and construction of an “ecology of spirit,”<sup>78</sup> which is to say of *pharmaka* and technological environments that would facilitate self-care and a renewed focus on attention.<sup>79</sup> In place of a society of the dislocated and disaffected slumped in front of screens to anaesthetize the shock of relentless technological change, Stiegler envisages one of makers using the tools they have hitherto only consumed to experiment and produce new futures. To get there, he calls for a “politics of brains” to cultivate varied stimuli for the diversification of neuronal development and to overturn the monocultural diets on which we are feeding them.<sup>80</sup> “Noodiversity will be the key issue over the next few decades, and this will require a noopolitics to operate above and below the emerging neuroindustry.”<sup>81</sup>

The search for what this would mean in practice is already under way in new approaches to addiction therapy, which increasingly take aim at the consumerism of the multibillion dollar “rehab industry.” In the eyes of more than one commentator, the latter is the very archetype of toxic consumer lock-in, based on the sale of a commodified cure, grounded more in the fetishization-effect of marketing than in medical science, which puts its success rate at just 5%.<sup>82</sup> As Lewis puts it, “the definition of addiction as a disease, endorsed by the medical and scientific communities may be the most powerful marketing tool there is” for the purveyors of institutionalized rehabilitation, but “probably does more harm than good for most addicts.”<sup>83</sup> This is because of the way it reduces residents to passivified consumers, whose treatment depends exclusively on surrender to narrow modes of use prescribed by the rehabilitation environment. At the heart of the commercial arm of the disease-model of addiction treatment is the renunciation of self-control, the infamous surrender to a higher power so familiar from the Alcoholics Anonymous twelve-steps programme. It works by treating addicts as sick, the hapless victims of some genetic misfortune, who can only be cured if they substitute one potentially unlimited consumption with another, namely the interminable stints of often oppressive, often luxurious, residential therapy, which users are encouraged to consume to excess not just when it works, but above all when it fails. The failure of rehab to curb addiction is routinely attributed to the failures of the addicts themselves, via the dogmatically repeated mantra that they lack the

desire to go clean, or have not yet reached the “rock bottom” point required to generate that desire. But this dogma omits to consider the structural role that rehab plays in the further proletarianization of addicts, who are required to submit to depersonalizing, institutional regimes of sobriety, and who accordingly “do not participate in decisions about their care.” While this standard therapeutic technique may spare inveterate users a degree of guilt, it nonetheless repeats the act of submission to the object of consumption, at the cost of preventing residents from developing techniques to transform themselves by taking control of their surroundings.<sup>84</sup>

## CONCLUSION

*There is a special kind of denial that is completely postmodern, something that only awareness of addiction ... can produce: the nondenial denial. It used to be that you'd actually say that you weren't a drunk ... Nowadays you can't get away with that; knowledge of the nature of dependency is too pervasive. So you start to have people like me, people who say, I am an addict and I like it, try and stop me.*<sup>85</sup>

According to the writer and recovered junkie, Elizabeth Wurtzel, denial, once the hallmark of the addict's unconscious guilt, has nowadays given way to the blithe recognition of dependence. Stiegler might seem to agree, here. He has argued that the desublimation of desire into craven drives coincides with the collapse of the social superego and the sense of shame it caused us to feel at the experience of desire.<sup>86</sup> Consumerism's relentless promotion of greed and short-circuiting of the prohibitions that, by deferring satisfaction, make desire possible, has given rise to a “monde sans vergogne,” a “world of shamelessness” and guilt-free consumption (Stiegler 2005a). But one can qualify the apparent absence of affect by noting the role of addiction as a technique of disavowal for the momentary alleviation of guilt. Does disavowed disavowal thus become another symptom of an addiction-addled culture? If so, it permeates right through to the science of addiction, despite attempts to exonerate itself of complicity. Deliberating on the dissociative, detached sociality of young people, who over the last generation have exhibited “a dramatic decline in interest in other people,” and who “purpose-driven, plugged into their media, ... pay little attention to those around them,” the psychologist Sherry Turkle looks like a prime example of one who allows the unpalatability of presumed conclusions to justify a refusal to countenance the prospect that consumer technologies might be addictogenic. Technology addiction is no more than

metaphorical addiction, she insists, implicitly invoking the dubious, outdated, distinction between “real” addictions that induce chemical brain change and the mere “psychological” ones that don’t.

But however apt the metaphor, we can ill afford the luxury of using it. Talking about addiction subverts our best thinking because it suggests that if there are problems, there is only one solution. To combat addiction, you have to discard the addicting substance. But we are not going to ‘get rid’ of the Internet. We will not go ‘cold turkey’ or forbid cell phones to our children. . . . The idea of addiction, with its one solution that we know we won’t take, makes us feel hopeless. We have to find a way to live with seductive technology and make it work to our purposes.<sup>87</sup>

For all her good intentions of wanting to avoid a dispiriting mass-stigmatization, Turkle’s aversion to a diagnosis of addiction rests on a distaste for what would be an absolutist and retrograde approach to addiction treatment, which sees abstinence as the only cure for excess. The assumption of a stark choice between unregulated consumption and complete withdrawal repeats the exculpatory, ideological—which is to say, naturalizing—mantra of the rehab industry: addiction is hardwired in nature and inescapable, rather than environmental, plastic and programmable. Stripped of alternatives, she is left with no choice but the classical disavowal of the addict who denies that there is a problem. Over and above a denial, Stiegler would also call it a “repression”—the repression of our originary technicity, of the way in which we are not “natural,” but constituted through and through by the artefactual *pharmaka* that inscribe second natures into the brain via the dopamine system.<sup>88</sup> From the standpoint of Stieglerian pharmacology, the dichotomy Turkle sets up is a false one. The cure is not to jettison the *pharmakon*, but to cultivate its capacity for transformation. The same drug that, when consumed in a toxic environment, further mires us in toxicity, can also enable us to project visions for environmental and self-transformation. The key for therapy, surely, is to build *pharmaka* that facilitate, rather than inhibit, the construction of alternatives.

GERALD MOORE is Associate Professor of French in the School of Modern Languages and Cultures and Department of Philosophy, Durham University (UK). He is author of *Politics of the Gift: Exchanges in Poststructuralism* (Edinburgh University Press, 2011) and co-editor, with Christina Howells, of *Stiegler and Technics* (Edinburgh University Press, 2013). His

current monograph is *Artificial Selection: Towards a Critique of Adaptationist Reason*, which expands upon the material in this article by bringing Stiegler into dialogue with the contemporary evolutionary and life sciences. He can be contacted at [gerald.moore@durham.ac.uk](mailto:gerald.moore@durham.ac.uk)

## NOTES

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7. On "generalized addiction," see Stiegler, *What Makes Life Worth Living*, 27.
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9. See, for example, Peter Gratton, "Review of Bernard Stiegler, *Taking Care of Youth and Generations*" *Notre Dame Philosophical Reviews* (August 2010). Available online: <https://ndpr.nd.edu/news/24441-taking-care-of-youth-and-the-generations/>; also Chris Turner, "Kant avec Ferry: Some Thoughts on Bernard Stiegler's *Prendre Soins* 1: *De la jeunesse et des Generations*" *Cultural Politics* 6:2 (April 2010, 256).
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11. Marc Lewis, *The Biology of Desire: Why Addiction Is Not a Disease*. New York: PublicAffairs, 2015, x, 208.
12. Bernard Stiegler, *The Lost Spirit of Capitalism: Disbelief and Discredit*, 3, trans. Daniel Ross. Cambridge: Polity, 2014, 85.
13. Stiegler, *The Lost Spirit of Capitalism*, 86.
14. This and all subsequent parenthetical references in the standardized pagination are taken from Plato: *Complete Works*. Ed John M. Cooper, Indianapolis: Hackett, 1997.
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16. Stiegler, *What Makes Life Worth Living*, 10, 25.
17. Stiegler, *The Lost Spirit of Capitalism*, 86.
18. Stiegler, *Pharmacologie du Front National*, 126-7.
19. Bernard Stiegler, *Technics and Time, 1: The Fault of Epimetheus*, trans. Richard Beardsworth and George Collins, Stanford: Stanford University Press, 1998, 246-8.
20. Stiegler, *What Makes Life Worth Living*, 20-5.
21. Compare Stiegler, *The Lost Spirit of Capitalism*, 87, with Lewis, *The Biology of Desire*, 204-5.
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  33. See, for example, David J. Linden, *The Compass of Pleasure: How Our Brains Make Fatty Foods, Orgasm, Exercise, Marijuana, Generosity, Vodka, Learning, and Gambling Feel So Good*. Harmondsworth: Penguin, 2011, 64; Gabor Maté, *In the Realm of Hungry Ghosts: Close Encounters with Addiction*. Toronto: Vintage Canada, 2009, 390-4; John Booth Davies, *The Myth of Addiction*, 2nd edition. Amsterdam: Harwood, 1997, x.
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  35. Lewis, *The Biology of Desire*, 17-19.
  36. For a recent example of this tendency, see David J. Nutt and Liam J. Nestor *Addiction*. Oxford: Oxford University Press, 2013, 2-3.
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  40. Susan Greenfield, *Mind Change: How Digital Technologies Are Leaving Their Mark on Our Brains*. London: Rider, 2014, 188. On these studies, see also Robert Pies, "Should DSM-V Designate 'Internet Addiction' a Mental Disorder?" *Psychiatry (Edgmont)* 6:2 (2009, 33-6). Available online: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2719452/>
  41. Nutt and Nestor, *Addiction*, 17.
  42. Lewis, *The Biology of Desire*, 188-9.
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48. Stiegler, *What Makes Life Worth Living*, 27.

49. Bernard Stiegler, *Taking Care of Youth and Generations*, trans Stephen Barker. Stanford: Stanford University Press, 2010, 4.

50. Bernard Stiegler, *States of Shock: Stupidity and Knowledge in the Twenty-First Century*, trans. Daniel Ross. Cambridge: Polity, 2015, 44-5; Stiegler, *The Lost Spirit of Capitalism*, 87.

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54. See the closing paragraphs of Gerald Moore, "Prolégomènes à un manifeste des études digitales" *Études digitales*, 3 (2018), given originally as a paper at the conference General Organology: Minds, Bodies, Social Organisations and Technē, at the University of Kent, in November 2014, and again, in January 2016, at the Institut de Recherche et d'Innovation, in Paris. Stiegler first employs "noodiversity" in print in around 2017 ("The New Conflict of the Faculties and Functions: Quasi-Causality and Serendipity in the Anthropocene," trans. Dan Ross, *Qui parle*, 26:1, (2017, 94)), though the bases of the idea are already hinted at as early as 2005, in *Le Motif européen*, where he writes that the "the diversification of types" is as "indispensable to social life as biodiversity is to the growing vitality of organisms" (64). An unverified, but much earlier and potentially similar use of the term appears in an unpublished seminar paper given by F. Ambrogetti and G. Constantini, "For a Contribution of Political Sociology to the Study of Technology: The Concept of 'Noodiversity'" *Technological Strategies for the New Europe* (Lecce, April 2003).

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72. See especially Stiegler, *Taking Care*, 73-80.
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